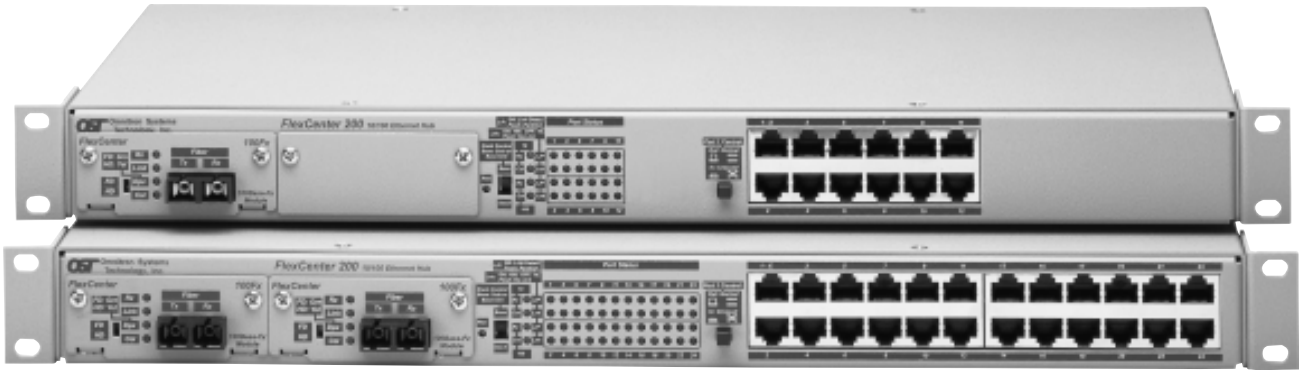
Omnitron Systems Technology, Inc.

# FlexCenter™ 200

## Auto-Sensing Dual Speed 10/100 and 100 Stackable Ethernet Hubs with Extended Distance Fiber Modules



## FEATURES

- The FlexCenter™ 200 is a 12/24 port 10/100 auto-sensing stackable Ethernet 802.3 hub with two optional interface modules.
- Simultaneously supports both 100 Mbps Fast Ethernet and 10 Mbps Ethernet stations, allowing a seamless migration to Fast Ethernet.
- Fiber modules feature a bridge element and extended distances of 2 km (1.2 mi.) with multimode (MM) models and 58 km (35 mi.) with single-mode (SM) models.
- Fiber modules support SC and ST connectors for flexibility in network design.
- The UTP module features a bridge element which allows cascading hubs by isolating their collision domains.
- Stacking of up to six hubs (150 ports) provides a cost-effective network design.
- Ports are individually-monitored and partitioned automatically when necessary for enhanced reliability.
- LED indicators report 10/100 speed, activity, partitioning and other critical network information.

## DESCRIPTION

The FlexCenter™ 200 is a 12/24 port 10/100 auto-sensing stackable Ethernet 802.3 hub with two optional interface modules.

Designed for seamless migration from standard 10 Mbps Ethernet to 100 Mbps Fast Ethernet, each of FlexCenter 200's ports can automatically detect the speed of the station connected to it and configure itself to accommodate the detected speed. A built-in bridge provides a transparent connection between the standard Ethernet and Fast Ethernet segments.

An optional stacking module connects up to six hubs to a maximum of 150 ports (144 ports plus six modules) sharing the same 10/100 segments.

Optional 100 Mbps fiber modules can be added to extend the network geographical size and connect the FlexCenter 200 hub to other hubs, switches or workstations. The extended distance modules feature a two-port built-in bridge that facilitates full-duplex operation and extends distances to 58 km (35 mi.). The fiber modules are available in multimode (MM) and single-mode (SM) with SC or ST connectors for flexibility in network design.

The 10/100 auto-sensing twisted pair (UTP) module features a two-port built-in bridge that allows full-duplex operation and cascading to another hub, switch, workstation or server.

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Each of the 12/24 ports of the FlexCenter 200 supports EIA/TIA 568 unshielded twisted pair (UTP) wiring. When the hub is connected to a 10Base-T station (standard Ethernet), categories 3, 4 and 5 wiring can be used. When the hub is connected to a 100Base-Tx station (Fast Ethernet), category 5 wiring should be used. Port 1 features a switch-selectable crossover mode that facilitates the use of a straight-through cable when connecting between hubs, and eliminates the need for a crossed cable. Per the IEEE 802.3 standard, this connection is limited to five meters when operating at 100 Mbps (Fast Ethernet).

The FlexCenter 200 is pre-configured to operate automatically and is ready to run right out of the box. No setup is required. When needed, a set of switches can configure the ports (in groups of four ports) to operate at 10Base-T or 100Base-Tx.

All ports are individually-monitored for legal operation. A defective port violating transmission protocol is disconnected (partitioned) by the FlexCenter 200; it is reconnected when normal behavior is restored.

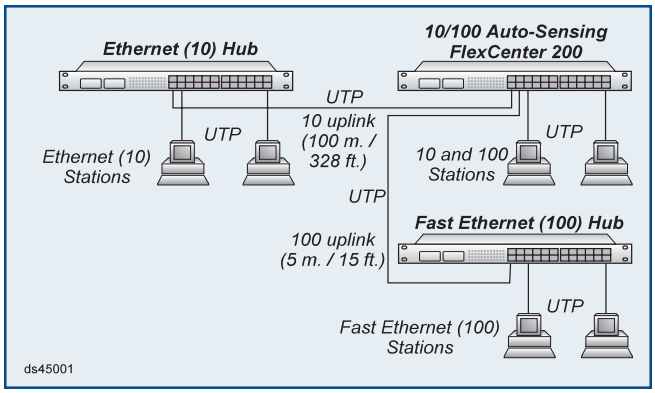
The FlexCenter 200 provides diagnostics data through LED indicators that assist in network installation and maintenance. Per-port LED indicators report 10/100 speed, activity, partitioning and other critical network information. Per-segment LEDs report 10 and 100 segment activities and collisions.

The FlexCenter 200 is powered by an internal universal power supply and operates in standard office and wiring closet environments. It is self-configuring and software-independent.

## SAMPLE APPLICATIONS

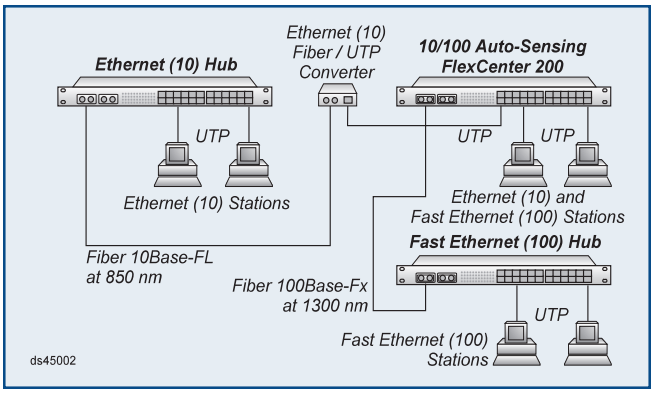
### Application 1. 10Base-T and 100Base-Tx UTP Integration

This application depicts a 10Base-T, a 100Base-Tx and a 10/100 FlexCenter 200 hub configuration. Both the 10Base-T and the 100Base-Tx hubs are connected to the FlexCenter 200's 10/100 UTP ports via uplink wires. The 10Base-T uplink can be category 3,4 or 5 grade and can be 100 m (328 ft.) maximum length. The 100Base-Tx uplink must be category 5 grade, and because it connects to a regular 10/100 UTP port, it is limited to five meters (15 ft.).



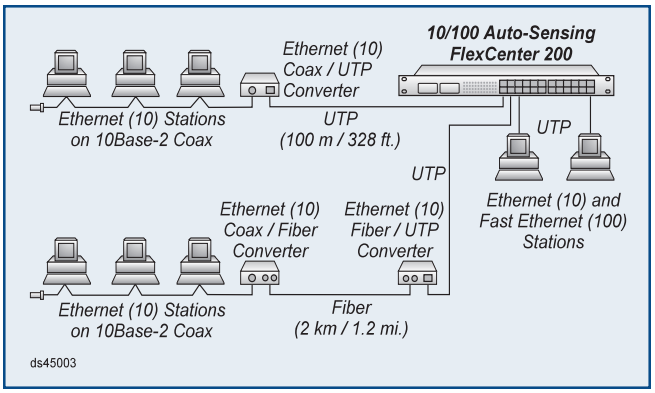

### Application 2. 10Base-T and 100Base-Tx Integration via Fiber

In this case an Ethernet 10Base-T hub is connected to the FlexCenter 200 via a fiber uplink. Since the Ethernet 10Base-FL fiber is specified (by 802.3) as 850 nm and the Fast Ethernet 100Base-Fx fiber is specified as 1300 nm, they can never be connected. The 10Base-FL link must be converted to 10Base-T before being connected to the FlexCenter 200's 10/100 UTP port. The 100Base-Fx uplink from the Fast Ethernet hub is connected to the FlexCenter 200's extended fiber uplink module facilitating 100 to 200 m of fiber (depending on the Fast Ethernet hub's network layout).




### Application 3. 10Base-2 Coax to 100Base-Tx Integration

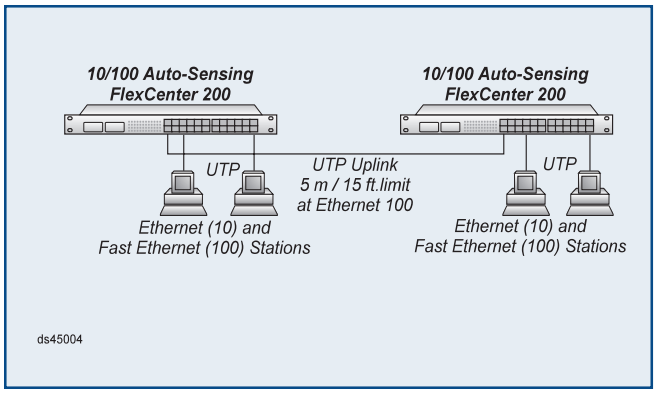
This application depicts the integration of legacy coax 10Base-2 network segments to a modern 10/100 FlexCenter 200 hub. The first case (top) depicts connection via a 10Base-2 Coax to 10Base-T UTP converter to a 10/100 FlexCenter 200 port. In the second case (bottom), the distance between the coax segment and the FlexCenter 200 is more than 100 meters and it requires fiber conversion. A 10Base-2 coax to fiber converter is used to convert coax to fiber, and a 10Base-FL fiber to 10Base-T UTP converter is used to convert fiber to UTP which is connected to a 10/100 FlexCenter 200 port.




### Application 4. Single Wiring Closet / Two Hubs

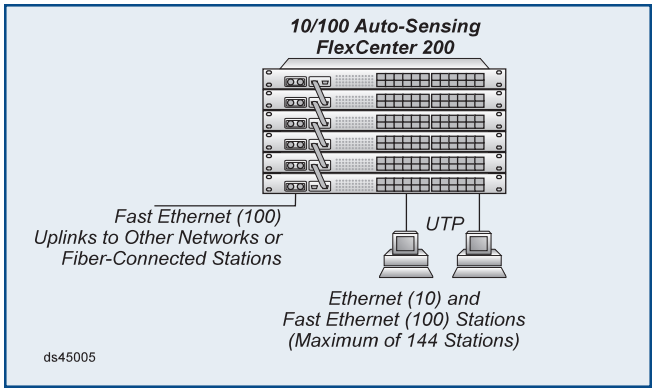
This application depicts the basic connection between two 10/100 auto-sensing FlexCenter 200 hubs. A straight-through patch cord connects between Port 1 of both hubs. (The

crossover switch on one of them is set to the crossed mode.) This application is cost-effective and simple, and it limits the distance between the hubs to 5 m / 15 ft. Only two hubs can be connected this way thus limiting the station count to 46.



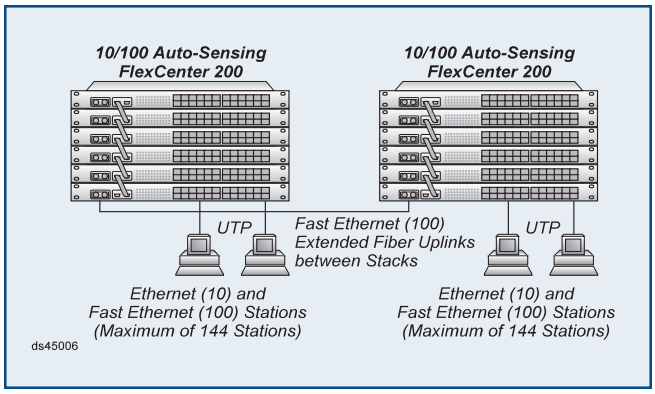

## Application 5. Single Wiring Closet / Multiple Hubs

This application depicts a single-wiring-closet-based network. It is a typical stacking application of the FlexCenter 200. In this case six hubs are stacked, accommodating up to 150 stations (144 ports plus six modules).



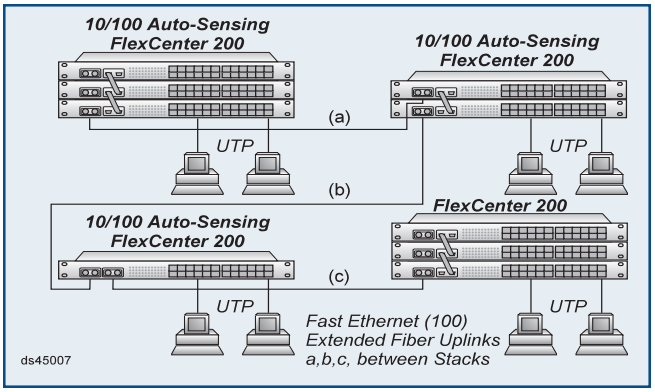

## Application 6. Multiple Wiring Closets / Multiple Hubs

This case depicts two stacks of hubs connected via a fiber uplink. Since an extended-distance-bridge-based module is used, full-duplex operation is possible for distances of 2 km (1.2 mi.) using multimode fiber, and 58 km (35 mi.) using single-mode fiber.



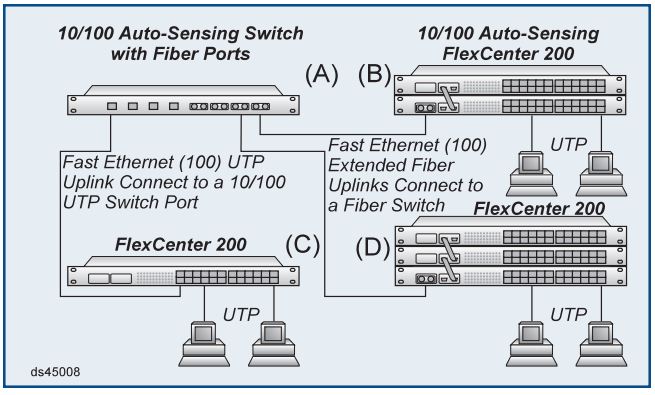

## Application 7. Flat Fiber Backbone

This application depicts a flat fiber backbone where hubs are stacked, and connected via extended fiber uplinks. As shown in this example, the module slots are used both for stacking as well as for fiber modules. Using the extended distance modules isolates the collision domains between each stack and facilitates a network that can span up to 58 km (35 mi.) per uplink.




## Application 8. Collapsed / Switched Fiber Backbone

This application depicts a collapsed fiber backbone where hubs are stacked, and connected via fiber and UTP uplinks to a single location, 10/100 auto-sensing switch with fiber ports, in a star fashion. This application is similar to the flat backbone with the difference of being a single point of management and control for the different subnetworks. In this case two stacks of hubs, B and D, are connected via extended distance fiber modules to the fiber ports of the switch. The hub in location C is connected via UTP to a 10/100 UTP port on the switch and is able to reach a distance of 100 m (328 ft.).



## SPECIFICATION

- **Protocol:** IEEE 802.3, 10Base-T, 100Base-Tx, 100Base-Fx
- **Interface Connectors:**
  - **Hub:**
    - **UTP:** (12/24) RJ45 pins 1-2, 3-6 active
  - **100Fx Module:**
    - **Fiber Optic:** (1) SC or ST
  - **10/100Tx Module:**
    - **UTP:** (1) RJ45 pins 1-2, 3-6 active
- **Cable Types:**
  - **UTP:**
    - **10Base-T:** EIA/TIA 568, Category 3, 4, or 5
    - **100Base-Tx**: EIA/TIA 568, Category 5
  - **Fiber:**
    - **Multimode (MM):** 50/125, 62.5/125, 100/140 um
    - **Single-Mode (SM):** 9/125 um
- **Supported Distances:**
  - **UTP:** 100 m / 328 ft.
  - **MM, Extended:** 2 km / 1.2 mi.
  - **SM, Extended:** 25 km / 15 mi.
  - **SM, Long Haul (LH):** 58 km / 35 mi.
- **Indicators:**
  - **Hub:**
    - **Power:** LED (1), Yellow (10/100) or Green (100), power applied
    - **Activity 10:** LED(1), Green, activity detected
    - **Collision 10:** LED (1), Yellow, collision detected
    - **Activity 100:** LED(1), Green, activity detected
    - **Collision 100:** LED (1), Yellow, collision detected
    - **Link / Partition:** LED (12/24), Green, per port: device detected / port partitioned
    - **Port Speed:** LED (12/24), Green, per port: 10 / 100 / Searching
  - **100Fx and 10/100Tx Modules:**
    - **Data Received:** LED (1), Green, data received
    - **Link / Speed:** LED (1), Green / Yellow: device detected and 10/100 speed
    - **Duplex Mode:** LED (1), Green / Yellow Full Duplex / Half Duplex
    - **Collision:** LED (1), Yellow, collision detected
- **Switches:**
  - **Hub:**
    - **UTP Crossover:** Straight / Crossed
    - **Stack Control:** Base / Stack
    - **Port Access Control:** 6/12 Switches, 2 per 4 ports: Auto-Sensing / 100Base-Tx / 10Base-T
  - **100Fx Module:**
    - **Duplex Mode:** Full / Half-Duplex
  - **10/100Tx Module:**
    - **UTP Crossover:** Straight / Crossed
    - **Auto-Sensing Mode:** Auto-Sensing / Manual
    - **Duplex Mode:** Full-Duplex / Half-Duplex
    - **Speed Control:** 100Base-Tx / 10Base-T
- **Dimensions / Weight:** W:19.0"xD:8.0"xH:1.75" / 7 lb.
- **Power:** 110 / 230 VAC, 50 / 60 Hz
- **Environmental:**
  - **Temperature:** 0 to 40 degrees C
  - **Humidity:** 0-90% (non-condensing)

## ORDERING INFORMATION

***Model*** ***Description***

***Hubs***

*4500-xy FlexCenter 200, 10/100, 12 Ports*
*4501-xy FlexCenter 200, 10/100, 24 Ports*
*4550-xy FlexCenter 200, 100, 12 Ports*
*4551-xy FlexCenter 200, 100, 24 Ports*

***Modules***

*4570 10/100Tx, UTP, XD*
*4571 100Fx, Fiber, XD, SC/MM, 2 km / 1.2 mi.*
*4572 100Fx, Fiber, XD, SC/SM, 25 km / 15 mi.*
*4573 100Fx, Fiber, XD, ST/MM, 2 km / 1.2 mi.*
*4574 100Fx, Fiber, XD, ST/SM, 25 km / 15 mi.*
*4575 100Fx, Fiber, LH/XD, SC/SM, 58 km / 35 mi.*
*4576 100Fx, Fiber, LH/XD, ST/SM, 58 km / 35 mi.*
*4580 100Tx, UTP, SD, 100 m / 328 ft.*
*4581 100Fx, Fiber, SC/MM, SD, 100-200 m / 328-656 ft.*
*4582 100Fx, Fiber, SC/SM, SD, 100-200 m / 328-656 ft.*
*4583 100Fx, Fiber, ST/MM, SD, 100-200 m / 328-656 ft.*
*4584 100Fx, Fiber, ST/SM, SD, 100-200 m / 328-656 ft.*
*4590 STK, Stack Module*

*XD refers to Extended Distance Bridge / Switch.*
*LH refers to Long Haul Extended Distance Bridge / Switch.*
*SD refers to Short Distance Non-Bridge / Non-Switch.*

***Accessories***

*4598 Mounting Ears*
*4599 FlexCenter 200, Blank Module Plate*

*Pre-configured kits which are equipped with interface modules are available for models 4500, 4501, 4550, 4551. To specify a kit, select modules by indicating the module code below in place of the letters x and y in the FlexCenter model number (x being the left slot, y the right slot):*

*0 Blank Slot, Blank Module Plate*
*1 4571, 100Fx, Fiber, XD, SC/MM, 2 km / 1.2 mi.*
*2 4572, 100Fx, Fiber, XD, SC/SM, 25 km / 15 mi.*
*3 4573, 100Fx, Fiber, XD, ST/MM, 2 km / 1.2 mi.*
*4 4574, 100Fx, Fiber, XD, ST/SM, 25 km / 15 mi.*
*5 4575, 100Fx, Fiber, LH/XD, ST/MM, 58 km / 35 mi.*
*6 4576, 100Fx, Fiber, LH/XD, ST/SM, 58 km / 35 mi.*
*8 4570, 10/100Tx, UTP, XD*
*9 4590, STK, Stack Module*

*Notes:*
*a. For a non-pre-configured unit, specify 0 for x and y (xy=00).*
*b. The Stack module can be used only in the right slot. (x cannot be 9.)*
*c. 12-port hubs (Models 4500, 4550) support only the stacking module in the right slot. (y can be 0 or 9 only.)*

*For assistance with configurations and for information about additional modules, consult factory.*



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